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# PUBLIC WORKS AND ENGINEERING SERVICES ON A PUBLIC SERVICE BASIS

BY WILLIAM H. CONNELL,

Chief, Bureau of Highways and Street Cleaning, Philadelphia.

Publicity of the right kind is the keynote in all campaigns relating to matters in which the public is concerned. Lack of this kind of publicity is more responsible than any other cause for the slow progress that has been made in placing public works and engineering on a public service basis throughout the United States. While it is true that in some instances public and engineering services are conducted on a basis that might well serve as an example to some public service corporations and industrial establishments, still in many localities there is a woeful lack of appreciation of the necessity of engineering service in conducting public work. This is particularly true in highway work in which it is not an uncommon thing for lawyers and laymen to be in charge of departments controlling such work.

Engineers as a rule do not do justice to the public side of their work and consequently the public does not appreciate as much as it should the value of their services. Technical descriptions of engineering work are invaluable for engineers but simplicity in publicity concerning matters relating to public work will educate the public mind with respect to the real value of engineering services. The people should be instructed in a general way concerning the day-to-day problems confronting the engineer in public service. This can be done through the press, periodicals, pamphlets, and by erecting signs on the site of the work containing a simple description of the project. It is only through such an educational campaign that we can ever hope to obtain the support of the public in matters pertaining to the public service. This is part of the engineer's work and what might come under the head of the business side of engineering on a public service basis.

In many sections of the country there is probably no branch of public work in such need of engineering services as is highway work. It is only through the right kind of publicity impressing

this fact on the public that this work will eventually be placed strictly on an engineering basis. It is estimated that nearly \$400,000,000 a year is spent on highway work. The economic administration of such an enormous expenditure annually is certainly a matter that should receive serious consideration on the part of the public.

The most essential factor in the administration of large affairs is organization. Therefore, in so far as highway work is concerned, a good engineering organization is just as essential to good roads and pavements as are the materials used to construct them. This is not a theory but a fact and one that unfortunately has not been given proper recognition in the United States, and only now is dawning on the public at large. The fault lies partly with the engineer, and not entirely with the politician who only too frequently is blamed for this state of affairs. The average politician is naturally inclined to parcel out all the jobs he can to his followers, who are in a sense his employees. As engineers are not found among political workers, it is perfectly natural that any public work, not generally recognized by business men and men of other professions to be distinctly engineering work, would not be regarded as such by the politician whose desire is to provide as many places as possible for his associate political workers. The responsibility for this state of affairs, therefore, rests in a measure with the engineer, since the profession as a whole has regarded the highway problem too lightly and has not been sufficiently jealous of the infringement upon its rights; namely, to supervise all work, public or private, that is of an engineering nature. The doctors and lawyers have to build up safeguards to protect what they consider their prerogatives. You never find an engineer supervising or conducting work coming under the jurisdiction of either one of these professions. But there are innumerable cases of lawyers and business men placed at the head of highway departments—the excuse being that they are executives. Nevertheless, this is engineering work, and while one of the principal requisites for such a position is executive ability, engineering knowledge is equally important, and the real qualification essential for the directing head to conduct such a department successfully is engineering executive ability, not executive ability engineered by a business man or a lawyer,

such as we have been having in many of our state, municipal, county and town highway departments.

Business concerns must advertise their goods not only for the purpose of encouraging sales, but for the protection of the public, as well as for self-protection; they must call attention to any imitations that will not answer the purpose or bring about the desired results. It is considered to be, and as a matter of fact is, the duty of the exponents of the professions of medicine and law to educate the people to protect themselves by taking advantage of the protection to person and property afforded through relying upon members of these respective professions in matters to which they can best attend. Likewise it is the duty of the engineering profession to educate the public to get a dollar's worth for a dollar of expenditure, whether it relates to public or private work, so long as it is engineering work, by employing competent engineers to supervise highway and other engineering work. This means engineers to plan, organize, and operate all highway departments. In other words, a proper *highway engineering organization* does not mean engineers working under the direction of a lawyer or business-man commissioner, but an engineering organization from top to bottom, with an engineer heading the organization, no matter what the title may be. This principle is an important one and should be ever before the young engineer. He should be brought to consider seriously the prerogatives and functions rightfully belonging to members of his profession—organization work, executive ability, business management, should be part of his professional training; they are just as essential to the engineer as they are to the lawyer, doctor or business man.

The highway work in a large percentage of our states, municipalities, counties and townships has been handled by all classes of officials from as many different walks of life, none of which gave them a claim to any qualification for the job. As a result, the highway work was allowed to drift along until the highway department was considered to be the property of the politician, and, still worse, only recently it has been used by some of the business administrations throughout the country to parcel out a few jobs to men probably deserving of some recognition, but conspicuously unfit in so far as highway work is concerned. In this policy they have made a great mistake, as the highway department in a large measure

is the principal show-case of any state, city, county or town government—the pavements representing the goods in the window. Recent developments have proved that more people can be pleased and satisfied through an engineering highway organization, conducted on a high plane, than through any other branch of public works. An adequate organization, however, is essential, as a successful highway administration is dependent upon conducting and controlling the work with the least friction. Ease of operation is a most important factor and this can be obtained only through an organization commensurate with the demands made upon it.

*Planning Boards as a Means of Simplifying the Control of Public Works Departments*

In an endeavor to define some means of simplifying the control and insuring a more thorough and intimate knowledge of the status of the operations coming under the jurisdiction of a large highway department than that afforded through the up-to-date records and definite procedures for each operation, it became evident to me that it would be necessary to supplement these records and procedures with planning boards containing a graphic representation of the status of the operations, in such a manner that the work could be more readily controlled than is the case where it is necessary to refer constantly to office records. No matter how thoroughly the operations of a highway department may be systematized, where the heads of the different units of the organization are dependent upon daily consultations and studies of the records on file to enable them to picture in their minds the status of the work under their jurisdiction, there is always a certain amount of lost motion and unbalancing of the work, resulting in one locality receiving undue consideration at the expense of another or delays in the starting of important contracts due to unconsciously yielding to outside influences interested in pushing forward less important work. This new scheme for simplifying the control of the work of a department through visualizing the operations enables the executive and division heads to obtain at any time a mental picture of the status of the operations coming under their respective jurisdictions. It is the most up-to-date system heretofore employed in highway departments or industrial corporations to carry on the work in an orderly and systematic manner. While planning boards have been

used with success in some of the industrial establishments, the application of this method of carrying on the operations of a large highway department is new. After several months' trial it has proved an unqualified success and one of the most practical schemes that has thus far come under my observation for simplifying the management of such a department. For some time past we have indicated certain data on maps, such as the progress of contracts, location of work, etc., but the planning boards referred to are used as a means of control of the entire operations of the department other than such work as is performed in accordance with a fixed schedule.

This method of visualizing the status of the work also enables the executive to readily give information concerning the operations under his jurisdiction that would ordinarily necessitate 'phoning to the office where the records are kept, which would mean a delay of several minutes before the information could be obtained from the record files. With the use of the planning board and visible card index system it is possible to obtain the necessary information in less than a minute. This saving of time means a great deal to a man interviewing a number of people every day requesting such information.

In the Philadelphia Bureau of Highways and Street Cleaning planning boards have been installed in the offices of the chief engineer, and in those of the two division engineers in charge of general highway department work, the division engineer in charge of bridge and sewer maintenance, and the seven district highway engineers.

They consist of a map indicating, in different colors, the character of all the pavements and unimproved streets throughout the city, mounted on a board and encased in a frame. The scale of the map is such as is necessary to contain the information desired in each specific case; for example, the scale of the district engineer's map, which contains the locations of holes in the pavements, etc., is necessarily greater than that of the chief engineer's map, which does not show such detail.

The scheme is a very simple one, and is not difficult to operate. The status of contract and municipal repair work, bituminous surface treatments, etc., and the location of the repair gangs and all other information contained on the boards are indicated by pins with

heads of different colors, shapes and sizes. For example, the status of the contract work may be followed by noting the appearance and disappearance of the pins. When any grading, paving, repaving, surfacing or resurfacing is completed, the limits of the work are colored with the coloring used on the standard map of the Bureau of Highways indicating the different characters of pavements and unimproved streets and roads. In the case of repair work, when the repairs are made the pins are removed; and the status of bituminous surface treatment and all other work (except that which is done in accordance with a fixed schedule such as street cleaning) coming under the jurisdiction of the Bureau is indicated in a similar fashion.

All information pertaining to permanent locations or fixtures is indicated on the planning boards by properly colored and symbolized thumb tacks which are inserted flush with the surface of the map. In general there are included in this classification such designations as the main and district highway offices, store yards, railroad sidings, ash, rubbish and street dirt dumps, disposal plants for rubbish and garbage, stables, and asphalt plants; while in the temporary or variable classification different colored and sized pins indicate the authorized work, the executed contracts, those in progress, or suspended, work by municipal forces, etc., and other details relating to the work that it is necessary to visualize in order to properly plan and control. Of course the exact details of the legend for each kind of planning board varies, and is arranged to suit the specific requirements of the particular planning boards to which it is to apply. Subject to these necessary variations the indications are, however, standard for any similar designations that appear on all of the planning boards.

In order to facilitate reference to information in greater detail, the indicators for the permanent designations also contain an identifying serial number, which refers to lists annexed to the planning board which indicate full information relative to locations, names of owners of asphalt plants, dumps, etc.

The details of the legends employed on the several planning boards in use in the Philadelphia Bureau of Highways and Street Cleaning can best be shown by the illustrations on pages 109 and 110.

PLANNING BOARD OFFICE OF CHIEF ENGINEER BUREAU OF HIGHWAYS AND STREET CLEANING DEPARTMENT OF PUBLIC WORKS CITY OF PHILADELPHIA		LEGEND	
PERMANENT DESIGNATIONS		TEMPORARY OR VARIABLE DESIGNATIONS	
<p><b>GENERAL:</b></p> <p>(pink) <b>(M)</b> MAIN HIGHWAY OFFICE.</p> <p>NOTE: In the following indications the numerical designations of districts are indicated by numerals.</p> <p>(pink) <b>(1)</b> DISTRICT HIGHWAY OFFICE.</p> <p><b>(2)</b> SERVICE DISTRICT (Street Cleaning and Ash, Rubbish and Garbage Collection).</p> <p>NOTE: In the following indications the serial identification numerals refer to correspondingly numbered detailed notes on lists annexed herewith.</p> <p>(Lt blue) <b>(X)</b> STORE YARD.</p> <p><b>(V)</b> DUMP (Ash, Rubbish or Street Dirt).</p> <p><b>(V)</b> GARBAGE DISPOSAL PLANT.</p> <p><b>(V)</b> RUBBISH DISPOSAL PLANT.</p> <p><b>(X)</b> STABLE (Service Contractors).</p> <p><b>(X)</b> CONTRACTOR'S ASPHALT PLANT.</p> <p><b>(V)</b> MUNICIPAL ASPHALT PLANT.</p> <p>Blue + black <b>EXISTING PAVEMENTS:</b></p> <p><b>(Black)</b> ASPHALT BLOCK.</p> <p><b>(Grey)</b> BITUMINOUS MACADAM.</p> <p><b>(Green)</b> CEMENT CONCRETE.</p> <p><b>(Buff)</b> COBBLE OR RUBBLE.</p> <p>(Lt blue) <b>(Lt blue)</b> SHEET ASPHALT.</p> <p>Red + black <b>(Black)</b> SLAB BLOCK.</p> <p><b>(Purple)</b> STONE BLOCK.</p> <p><b>(Yellow)</b> UNIMPROVED (Gravel, dirt, cinder, etc.).</p> <p><b>(Black)</b> VITRIFIED BLOCK.</p> <p><b>(Lt Green)</b> WATERBOUND MACADAM.</p> <p><b>(Hatched)</b> WOOD BLOCK.</p> <p><b>MISCELLANEOUS:</b></p> <p><b>(O)</b> RAILROAD SIDING.</p> <p><b>(—)</b> DISTRICT BOUNDARY LINE.</p> <p><b>CHARACTER OF AUTHORIZED CONSTRUCTION WORK:</b></p> <p><b>(Yellow)</b> GRADING.</p> <p><b>PAVEMENT:</b></p> <p><b>(Grey)</b> BITUMINOUS MACADAM.</p> <p><b>(Green)</b> CEMENT CONCRETE.</p> <p><b>(Blue)</b> SHEET ASPHALT.</p> <p><b>(Lt Green)</b> STONE BLOCK.</p> <p><b>(Red)</b> VITRIFIED BLOCK.</p> <p><b>(Lt Green)</b> WATERBOUND MACADAM.</p> <p><b>(Hatched)</b> WOOD BLOCK.</p>		<p><b>INDICATION OF LIMITS OF AUTHORIZED WORK:</b></p> <p><b>(Black)</b> IF HIGHWAY IS NOT COLORED.</p> <p><b>(Yellow)</b> IF HIGHWAY IS COLORED.</p> <p><b>(Yellow)</b> IF NECESSARY IN CONJUNCTION WITH THE PREVIOUS INDICATIONS TO SHOW LIMITS OF CONTIGUOUS AUTHORIZATION.</p> <p><b>(Yellow)</b> IF WORK IS THAT OF SURFACE TREATMENT.</p> <p><b>TECHNICAL CLASSIFICATIONS OF AUTHORIZED WORK:</b></p> <p><b>CONTRACT WORK:</b></p> <p><b>(Green)</b> GRADINGS.</p> <p><b>(Red)</b> PAVING.</p> <p><b>(Blue)</b> REPAVING.</p> <p><b>(O)</b> SURFACING.</p> <p><b>(Green)</b> RESURFACING.</p> <p><b>(Green)</b> SPECIAL WORK (Park Development, Boulevard Construction, etc.).</p> <p><b>MUNICIPAL FORCE WORK:</b></p> <p><b>(Grey)</b> EXTENSIVE SURFACING, RESURFACING AND REPAVING.</p> <p><b>(O)</b> DUST LAYER TREATMENT.</p> <p><b>(Yellow)</b> BITUMINOUS SURFACE TREATMENT.</p> <p><b>STATUS OF WORK:</b></p> <p><b>(O)</b> CONTRACT EXECUTED OR IN COURSE OF EXECUTION.</p> <p><b>(Red)</b> WORK IN PROGRESS BY CONTRACTOR.</p> <p><b>(Blue)</b> WORK IN PROGRESS BY MUNICIPAL FORCES.</p> <p><b>(Black)</b> TROUBLE MARKER (Interruption, delay, suspension, etc.).</p> <p><b>WORK DETAILS:</b></p> <p><b>(Red)</b> URGENT NECESSITY FOR PROMPT PERFORMANCE OF WORK.</p> <p><b>(Yellow)</b> MATERIALS ORDERED.</p> <p><b>(O)</b> MATERIALS DELIVERED.</p> <p><b>(O)</b> CONTRACTOR'S ASPHALT PLANTING GONE (GENERAL WORKING LOCATION).</p> <p><b>(O)</b> MUNICIPAL ASPHALT REPAIRING GONE (GENERAL WORKING LOCATION).</p> <p><b>MISCELLANEOUS:</b></p> <p><b>(O)</b> ORDINANCE PERMITS TO AUTHORIZE WORK.</p> <p><b>(Yellow)</b> OUTSTANDING TICKLER (indicating existence of open relative correspondence).</p> <p><b>DETAILED INFORMATION:</b></p> <p>Full detailed information relative to the current status of the legal, contract, structural and other governing conditions pertaining to all work posted on this planning board is indicated on the individual card records for each specific authorization in the current status file.</p>	

LEGEND ON PLANNING BOARD, OFFICE OF CHIEF ENGINEER

PLANNING BOARD OFFICE OF DISTRICT ASSISTANT ENGINEER BUREAU OF HIGHWAYS & STREET CLEANING DEPARTMENT OF PUBLIC WORKS CITY OF PHILADELPHIA PERMANENT DESIGNATIONS		LEGEND	
<b>GENERAL:</b> (M) MAINT HIGHWAY OFFICE. (Pink) NOTE: In the following indications the numerical designation of districts are indicated by numerals. (1) DISTRICT HIGHWAY OFFICE. (2) SERVICE DISTRICT (Street Cleaning and Rubbish and Garbage collection). NOTE: In the following indications the special identification numerals refer to correspondingly numbered detailed notes on lists annexed herewith. (Lt Blue) STOREYARD OR STORAGE LOCATION. (Dk Blue) DUMP (Rubbish or Street Dirt). (G/A) GARBAGE DISPOSAL PLANT. (Y/A) RUBBISH DISPOSAL PLANT. (S/A) STABLE (Service Contractor). (C/A) CONTRACTOR'S ASPHALT PLANT. (M/A) MUNICIPAL ASPHALT PLANT.		<b>TEMPORARY OR VARIABLE DESIGNATIONS</b>	
<b>EXISTING PAVEMENTS:</b> (Blue & Black) ASPHALT BLOCK. (Grey) BITUMINOUS MACADAM. (Green) CEMENT CONCRETE. (Buff) COBBLE OR RUBBLE. (Lt Blue & Black) SHEET ASPHALT. (Black) SLAB BLOCK. (Purple) STONE BLOCK. (Yellow) UNIMPROVED (Gravel, dirt, cinders, etc.). (Pink) VIRTRIFIED BLOCK. (Lt Brown) WATERBOUND MACADAM. (Wood) WOOD BLOCK. (Diagonal Lines) PAVEMENT UNDER MAINTENANCE GUARANTEE.		<b>CHARACTER OF AUTHORIZED CONSTRUCTION WORK:</b> Yellow GRADING. Grey PAVEMENT. Green BITUMINOUS MACADAM. Blue CEMENT CONCRETE. Lt Blue SHEET ASPHALT. Dk Brown STONE BLOCK. Red VIRTRIFIED BLOCK. Lt Brown WATERBOUND MACADAM. Wood WOOD BLOCK.	
<b>MISCELLANEOUS:</b> (O) RAILROAD SIDING. (Green) BRIDGES TO BE CLEARED. (Green) MARKETS TO BE CLEARED. (Green) ALLEYS TO BE CLEARED. (Blue) SEWER INLET. (Blue) CHYDER BOX. (Green) RUBBISH CHY. (Red) FIRE HYDRANT. (Red) FIRE HYDRANT (For Service use). DISTRICT BOUNDARY LINE. RAILWAY TRACK STRUCTURE.		<b>INDICATION OF LIMITS OF AUTHORIZED WORK:</b> If HIGHWAY IS NOT COLORED. If HIGHWAY IS COLORED. If NECESSARY IN CONJUNCTION WITH THE PREVIOUS INDICATIONS TO SHOW LIMITS OF CONTIGUOUS AUTHORIZATIONS. If WORK IS THAT OF SURFACE TREATMENT.	
<b>TRACK OWNERSHIP SYMBOLS:</b> BO BALTIMORE AND OHIO RAILROAD COMPANY. FTH FARMINGTON, TACONY AND HOLMESBURG TRACTION COMPANY. POR PENNSYLVANIA RAILROAD COMPANY. PAR PHILADELPHIA AND READING RAILWAY COMPANY. PR PHILADELPHIA RAILWAYS COMPANY. PRT PHILADELPHIA RAPID TRANSIT COMPANY. RT READING TRANSIT COMPANY.		<b>TECHNICAL CLASSIFICATIONS OF AUTHORIZED WORK:</b> DANGEROUS CONDITION REQUIRING IMMEDIATE ATTENTION. (Red) BY MUNICIPAL FORCES. (Red) BY A PUBLIC UTILITY OR A PRIVATE AGENCY. (Brown) REQUIRING ATTENTION AS SOON AS ECONOMICALLY POSSIBLE. (Brown) REPAIRS DESIRABLE BUT NOT ABSOLUTELY NECESSARY. (Green) EXTENSIVE GENERAL REPAIRS NECESSARY. (Blue) REPAIRING OR RESURFACING NECESSARY. (Pink) ADJUSTMENT OF GUTTERS OR SHOULDERS NECESSARY. (O) DUST LAYER TREATMENT. (Yellow) BITUMINOUS SURFACE TREATMENTS.	
<b>STATUS OF WORK:</b> WORK AUTHORIZED: (O) BY CONTRACT. (Green) BY MUNICIPAL FORCES. (Blue) TO BE PLACED UNDER CONTRACT. WORK IN PROGRESS: (Red) BY CONTRACTOR. (Lt Blue) BY MUNICIPAL FORCES. (Black) TROUBLE MARKER, (Interpretations, delay, suspension, etc.).		<b>WORK DETAILS:</b> (Red) URGENT NECESSITY, FOR PROMPT PERFORMANCE OF WORK. (Yellow) MATERIALS ORDERED. (Yellow) MATERIALS DELIVERED. (O) CONTRACTOR'S ASPHALT REPAIRING GANG: GENERAL WORKING LOCATION. (O) MUNICIPAL ASPHALT REPAIRING GANG: GENERAL WORKING LOCATION.	
<b>MISCELLANEOUS:</b> (Yellow) OUTSTANDING TICKLER, (indicating existence of open relative correspondence).		<b>DETAILED INFORMATION:</b> Full detailed information relative to the current status of the legal, contract, structural and other governing conditions pertaining to all work posted on this planning board is indicated on the individual card records for each specific authorization in the Current Status file.	

## CURRENT STATUS RECORDS

In addition to the data regularly carried on the planning boards there are also certain other data of a more detailed nature relative to the current status of the legal, contract, structural and other governing conditions, which should be easily accessible but which it would not be practicable to indicate on the planning board.

This information is, however, recorded in a very accessible manner by means of individual records properly filed and in visible filing cabinets, which are known as current status files, and which are located adjacent to the planning boards, and can best be described by the following illustrations:

Three forms of current status card records are provided, one form being for municipal force work and two for contract work for use in the main and district offices respectively. These records indicate in a logical and concise manner just what information is necessary relative to current conditions.

<b>Woodbine</b>		FROM <b>Lancaster</b>		TO <b>Upland</b>	
CLASSIFICATION		MATERIALS			
<b>BITUMINOUS SURFACE TREATMENT</b>		<b>ASPHALT CUT BACK</b>			
SCHEDULED	YES				
URGENCY OF WORK	YES				
MATERIALS ESTIMATED	YES				
MATERIALS IN STOCK	YES				
MATERIALS ORDERED	YES				
MATERIALS DELIVERED	YES				
WORK READY TO PROCEED	YES	WORK ORDERED STARTED	JUL 1 - 1915		WORK STARTED JUL 2 - 1915
GANG IN CHARGE OF FOREMAN <i>Simpson</i>				DIVISION /	DISTRICT /

BUREAU OF HIGHWAYS  
DEPARTMENT OF PUBLIC WORKS  
CITY OF PHILADELPHIA

HIGHWAY WORK PROGRESS RECORD  
MUNICIPAL FORCE WORK

PROGRESS RECORD FOR MUNICIPAL FORCE WORK

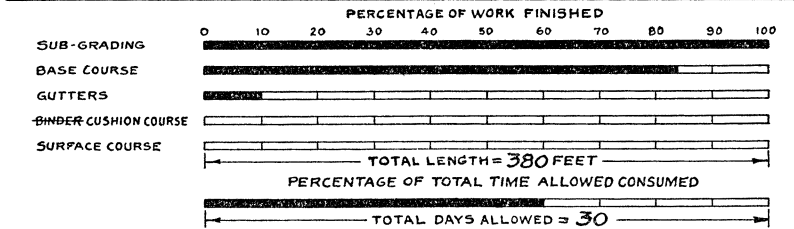
Indiana		FROM 24th		TO 26th	
CLASSIFICATION PAVING	SURFACE SHEET ASPHALT	GUTTERS VITRIFIED BLOCK	TRACKS DRESSED GRANITE BLOCK	BASE CEMENT CONCRETE	
WORK AUTHORIZED	JUL 6 - 1915	SCHEDULED	YES	GRADING	FINISHED
ON CITY PLAN	YES	ADVERTISED	AUG 4 - 1915	SEWER	FINISHED
LEGALLY OPENED	YES	BIDS RECEIVED	AUG 20 1915	LATERALS	FINISHED
CITY TAX RATE	YES	AWARDED	AUG 25 1915	WATER	FINISHED
NECESSITY FOR WORK	YES	ORDERED	AUG 26 1915	GAS	FINISHED
FUNDS AVAILABLE	YES	EXECUTED	SEP 2 - 1915	LIGHTING	FINISHED
PLAN ORDERED	YES	APPROVED	SEP 4 - 1915	CURBING	FINISHED
PLAN RECEIVED	YES	DRAWING No	3135		
WORK READY TO PROCEED	YES	NOTICE TO PROCEED ISSUED	SEP 9 - 1915	WORK STARTED	SEP 13 1915
CONTRACTOR			BARBER ASPHALT PAVING CO.		
			DIVISION	2	DISTRICT
			6		

BUREAU OF HIGHWAYS  
DEPARTMENT OF PUBLIC WORKS  
CITY OF PHILADELPHIA

HIGHWAY WORK PROGRESS RECORD  
CONTRACT WORK

### PROGRESS RECORD FOR CONTRACT WORK FOR MAIN OFFICE

Addison		FROM 58th		TO 59th					
CLASSIFICATION PAVING		SURFACE SHEET ASPHALT		GUTTERS VITRIFIED BLOCK		TRACKS —		BASE CEMENT CONCRETE	
GRADING	SEWER	LATERALS	GAS	WATER	LIGHTING	CURBING			
O. K.	O. K.	O. K.	O. K.	O. K.	O. K.	NOTICES EXPIRE	48-HOUR NOTICE	ORDER TO CONTRACTOR	REPORTED FINISHED
						9-18-15	9-19-15	9-22-15	10-2-15
CONTRACTOR						EASTERN PAVING CO.		NOTICE TO PROCEED	10-4-15
								WORK STARTED	10-12-15



BUREAU OF HIGHWAYS  
DEPARTMENT OF PUBLIC WORKS  
CITY OF PHILADELPHIA

HIGHWAY WORK PROGRESS RECORD  
CONTRACT WORK

### PROGRESS RECORD FOR CONTRACT WORK, DISTRICT OFFICE

It will be noted that the arrangement of the form of the current status record for contract work as used in connection with the district planning boards makes it possible to post graphically either daily or weekly from the inspectors' reports the percentages of each

portion of the work finished and the percentage consumed of the total time allowed for the completion of the work.

The responsibility for the posting of the planning board and the current status file is centralized in one person in each office, and this posting is done early each morning from the reports of the operations, transactions and changes in conditions occurring since the time of posting on the previous day. In the district offices, however, a record of the need for the performance of any character of work is posted as soon as the necessity becomes apparent from any source, such as being indicated on a patrol inspection report; resulting from observation by the district assistant engineer or his subordinates; notice from the main office or any municipal department, from the police, or from the public.

In the seven district highway offices and in the division of bridges and sewer maintenance, the daily route sheets indicating the work to be performed by each maintenance and repair gang is prepared by direct reference to the planning board.

To be explicit, the function of the planning board may be defined as being a means of providing the chief engineer, the division engineers and the district assistant engineers and their subordinates with a continuous and complete, concise and easily accessible graphic record of the current status of all construction and maintenance work under their respective supervision, as well as prospective work, in order that they may plan and administer the work in the most efficient manner, and also to facilitate the prompt determination of any desired general information relating to the work that otherwise would not be available except after more or less detailed investigation. The planning boards are also a practical means of controlling or equalizing the quantity of work to be performed in the different localities under the jurisdiction of the department, and the order in which the work shall proceed, and also of determining upon the assignment or distribution of the engineering, inspection and working forces.

In fact, the planning boards may be likened to a graphic representation or moving picture of the general activities of the department presenting sufficient detailed information to insure the carrying on of the work with a maximum of efficiency, and to do away with the friction and loss of time through the engineers in responsible charge of the several units of the organization being

compelled to make daily or perhaps constant reference to and studies of the filed records to enable them to form a mental picture of the status of the work under their jurisdiction. With this scheme, a few minutes' inspection of the planning board each morning will enable the engineer to keep in close touch with and thoroughly plan or control both the extensive and minor work under his supervision.

There are countless opportunities in the management of a large highway department, as is also the case in other public works departments and industrial establishments, not only to improve upon the quality of the output but to save time and money through making analytical studies of the operating methods. As an illustration of this, only recently, by assigning an engineer to make an analysis of the unit cost records of the municipal repair gangs, and studies of the methods pursued in the performance of the work, we have been able to show a saving of \$40,000 in four months, which is a direct result of eliminating a certain amount of the lost motion, due to inaugurating more efficient methods of carrying on this work. Therefore, this saving was brought about entirely through these special studies. This, however, is just one feature of the work of a highway department, but the opportunities afforded for analytical studies of the operations as a whole, and the standard that can be obtained through the systematic operation of planning boards to control the work, opens up a new field with unlimited possibilities that must necessarily result in the saving of enormous sums of money that cannot be definitely measured at the present time.

In the Philadelphia Bureau of Highways and Street Cleaning there are approximately 700 contracts in operation annually. This in itself, aside from the number of extensive operations performed by the departmental forces and the multiplicity of other work coming under the jurisdiction of such departments, whether they be city or state, involving expenditures of approximately \$400,000,000 annually, puts a premium on organization and management as a most important factor in connection with the operations of such departments, and is evidence of the fact that the solution for economic management of highway departments is the most important problem in highway engineering today.

The more we study the possibilities of the management of highway departments, the more impressed we will be with the fact

that thus far we have only touched the high spots, and that the logical and systematic management of such a department is something yet to be attained, and who can say what will be the result of the studies now being carried on in some of our highway departments, as there is no field in which there are better opportunities to apply scientific principles to the operations than to those coming under the jurisdiction of a highway department?